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# Formation of Smectite Crystals at High Pressures and Temperatures

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**Abstract:** Smectite single crystals of superior quality were synthesized at high pressures and temperatures using a modified belt type high pressure apparatus. Pressure-temperature conditions were established for smectite formation by quenching experiments in the pressure range from 2– 5.5 GPa and temperatures of 700° – 1000° C. Smectite crystals with extraordinary quality were formed beyond 3 GPa and 1000° C with coexisting phases of coesite, kyanite, jadeite, and in some cases with mica and glass. Smectite was confirmed from the XRD taken after intercalation of ethylene glycol. The smectite crystals were considered to be quenched crystals metastably from the hydrous silicate melts formed at high pressures and temperatures.

**Key Words:** High pressure • High temperature • Smectite • Synthesis

*Clays and Clay Minerals*; December 1994 v. 42; no. 6; p. 674-678; DOI: [10.1346/CCMN.1994.0420603](https://doi.org/10.1346/CCMN.1994.0420603)

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